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Environmental performance of buildings — Carbon metric of a building — Use stage

Performance environnementale des bâtiments — Métrique du carbone des bâtiments — Phase opérationnelle

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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 59, *Buildings and civil engineering works*, Subcommittee SC 17, *Sustainability in buildings and civil engineering works*.

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Introduction

Buildings contribute approximately one-third of global greenhouse gas (GHG) emissions. With its high share of emissions, the building and construction sector has the responsibility to take the global lead in implementing strategies to reduce GHG emissions. The building and construction sector has more potential and opportunity to deliver quick, deep, and cost-effective GHG mitigation than any other sectors. Carbon dioxide (CO_2) emissions contribute to global warming, which is one of the most recognized environmental impacts attributable to buildings.

In this context, measurement and reporting of GHG emissions from existing buildings are critical for enabling significant and cost-effective GHG mitigation. Currently, there has not been a globally agreed method established to measure, report, and verify potential reductions of GHG emissions from existing buildings in a consistent and comparable way. If such a method existed, it could be used as a universal tool for measurement and reporting of GHG emissions, providing the foundation for accurate performance baselines of buildings to be drawn, national targets to be set, and carbon trading to occur on a level playing field.

In principle, accurate and precise reporting can only be achieved if GHG emissions (and removals) from all life cycle stages of buildings are measured and/or quantified. However, not all countries in the world have sufficient capacity or resources to use and apply life cycle assessment (LCA) methodologies.

Respecting the need for collaboration on a global scale, the need exists for a metric that is usable not only in countries with sufficient number of experts and a precise database, but also in those countries where experts' services are limited and databases have considerable gaps. For instance, with the potential for global scale carbon trading within building-related sectors, a method that is consistently usable in both the well-developed and developing world is needed.

Operational energy use in buildings typically accounts for 70 %–80 % of energy use over the building life cycle. Therefore, the operating stage of the building's life cycle is the focus of measurement and reporting of direct and indirect GHG emissions.

This International Standard aims to set out a globally applicable common method of measuring and reporting of associated GHG emissions (and removals) attributable to existing buildings, by providing requirements for the determining and reporting of a carbon metric(s) of a building.

The carbon metric is a measure (a partial carbon footprint) that is based on energy use data and related building information for an existing building in operation. It provides information related to the calculation of GHG emissions and can be used as an environmental indicator. Using this approach, the metric and its protocol can be applied by all stakeholders in both developing and well-developed countries, where building energy consumption and other relevant data can be retrieved or collected, making it useful and globally transferable.

This International Standard aims to be practical for many stakeholders (i.e. not only for the building profession), who are expected to use the carbon metric of a building as reference for decision making in their business activities, governmental policies, and as a baseline for benchmarking.

The simplicity of approach provides applicability at all scales, ranging from cities and building portfolios to individual buildings.

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Environmental performance of buildings — Carbon metric of a building — Use stage

1 Scope

This International Standard provides requirements for determining and reporting a carbon metric of an existing building, associated with the operation of the building. It sets out methods for the calculation, reporting, communication, and verification of a set of carbon metrics for GHG emissions arising from the measured energy use during the operation of an existing building, the measured user-related energy use, and other relevant GHG emissions and removals. These carbon metrics are separated into three measures designated CM1, CM2, and CM3 (see 5.1.1).

This International Standard follows the principles set out in ISO 15392 and those described in Clause 4. Where deviations from the principles in ISO 15392 occur, or where more specific principles are stated, this International Standard takes precedence.

The carbon metrics CM1 and CM2 are not quantified based on life cycle assessment (LCA) methodology. Carbon metric CM3 may include partial quantification based on the results of LCA.

This International Standard does not include any method of modelling of the operational energy use of the building but follows the conventions provided by other International Standards, as given in relevant clauses.

This International Standard is not an assessment method for evaluating the overall environmental performance of a building or a building-rating tool and does not include value-based interpretation of the carbon metric(s) through weightings or benchmarking.

This International Standard deals with the application of the carbon metric(s) for an existing building, either residential or commercial, or a building complex. It does not include provisions for regional and/or national building stock.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 6707-1:2014, *Buildings and civil engineering works — Vocabulary — Part 1: General terms*

ISO 12655, *Energy performance of buildings — Presentation of measured energy use of buildings*

ISO 14050, *Environmental management — Vocabulary*

ISO 15392, *Sustainability in building construction — General principles*

ISO/TR 16344:2012, *Energy performance of buildings — Common terms, definitions and symbols for the overall energy performance rating and certification*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 6707-1, ISO 12655, ISO 14050, ISO 15392, ISO/TR 16344, and the following apply. Where differences or conflicts occur, the definitions given below shall take precedence.

NOTE A number of terms and definitions from these other sources have been repeated below, for ease of reference.

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